Year 6 Science: Drawing forces with arrows, and how levers help

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. A force arrow for a 20 N push is 4 cm long. How long should the arrow for a 40 N push be?

2. A cup sits still on a bench. Name the two forces on it and say how they compare.

3. A bike rolls along at a steady speed. The forward push is 60 N. How big is the backward force of friction and air resistance together?

4. A wheelbarrow is a lever. What is its pivot?

5. Why is a long-handled spade easier for turning soil than a short trowel?

Fix the mistake

6. Correct this statement: "A still book has no forces on it."

7. Correct this statement: "All force arrows can be the same length as long as they point the right way."

8. Correct this statement: "If something is moving, the forces on it cannot be balanced."

9. Correct this statement: "To make a lever easier, push close to the pivot."

Answer key (for parents and tutors)

1. A force arrow for a 20 N push is 4 cm long. How long should the arrow for a 40 N push be?
   8 cm, because the force is twice as big.
2. A cup sits still on a bench. Name the two forces on it and say how they compare.
   Weight pulls it down and the bench's support force pushes it up; they are the same size.
3. A bike rolls along at a steady speed. The forward push is 60 N. How big is the backward force of friction and air resistance together?
   60 N, because steady speed means the forces are balanced.
4. A wheelbarrow is a lever. What is its pivot?
   The wheel.
5. Why is a long-handled spade easier for turning soil than a short trowel?
   Your hands are farther from the pivot, so you need less force to lift the soil.
6. Correct this statement: "A still book has no forces on it."
   Its weight and the support force both act on it; they are balanced, so it stays still.
7. Correct this statement: "All force arrows can be the same length as long as they point the right way."
   The length shows the size, so a bigger force needs a longer arrow.
8. Correct this statement: "If something is moving, the forces on it cannot be balanced."
   Balanced forces can act on a moving object; it just keeps going at the same speed and direction.
9. Correct this statement: "To make a lever easier, push close to the pivot."
   Push as far from the pivot as you can; that needs the least force.